reported by several studies and the results are very different depending on cultivar analyzed. In this work we analyzed the viability and the *in vitro* germination of pollen in olive tree from different cultivars. These trees are located in the fields of trials from the "Finca La Orden" (Badajoz, Spain). These parameters were determined in the following olive cultivars: 'Arbequina', 'Morisca', 'Pico Limon', 'Picual', 'Verdial Badajoz', 'Manzanilla Sevillana', 'Manzanilla Cacereña' and 'Gordal'. The first five are cultivars for oil production and the last three are for table. The pollen viability was determined using the Alexander´s method that has been proven as an efficient test to assess pollen viability. The germination percentage is estimated using an *in vitro* germination test. The unifactorial analysis of variance revealed significant differences in the viability and germination of pollen from different cultivars used for oil production. However, the cultivars for table showed significant differences for pollen viability, but not in germination. The results show that viability is higher than the percentage of germination in all cultivars analyzed. Moreover, no correlation was found between viability and germination when the values from the different cultivars are compared.

S08.244

Seed Storage Proteins of the 11S Type in the Olive. Biochemical Characterization and Potential Uses

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Olive seeds contain large amount of protein in the form of protein bodies. Precursor forms of these proteins are made up of individual proteins, which have been purified to homogeneity and further named p1-p5 (20.5, 21.5, 25.5, 27.5, and 30 kDa, respectively). N-terminal sequences of p1 and p2 proteins displayed relevant homology to the basic subunit of the 11S family of plant SSPs (legumins). Analysis of endosperm and cotyledon tissues by 2-D electrophoresis in combination with mass spectrometry indicates the basic character of p1 and p2 and the acidic character of p3, p4, and p5 proteins. In addition, the putative presence of highly similar isoforms or post-translational modifications of these polypeptides was detected. As a result, a model describing the putative association of p1- p5 proteins into subunits of alpha(acidic)/beta(basic) type has been proposed. Solubility experiments have shown that the majority of these olive seed proteins from the 11S storage protein family are extracted with aqueous alcohol and only partially with water and diluted saline solutions, therefore suggesting their similarity to prolamines. By using a rabbit antiserum raised to p1 protein, the proteins have also been immunolocalized in olive seed tissues, showing that they accumulate in conspicuous protein bodies present in both the endosperm and the cotyledon. The abundance of SSPs points out mature olive seeds as a relevant nitrogen source for animal feeding. Preliminary assays of protein digestibility have been carried out. We also show how these SSPs are also present in several byproducts of olive oil manufacturing industries. Other relevant uses may exploit a putative discriminative character of these proteins among olive cultivars for breeding purposes.

S08.245

Evaluation of Four Varieties Regarding Their Suitability in High-Intensity Olive Orchards

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High-intensity olive orchards require high productive varieties with low vegetative vigor and low canopy volume. As a consequence these plants have a minimal economical life of about 15 year. The aim of this study was to test four varieties proposed by the nurseries for this training system in the Central Italian environment. In 2008 and 2009 the vegetative and productive activity of 'Arbequina', 'Arbosana', 'Don Carlo©' and 'FS 17©' were monitored on trees that were planted in 2006 in a high-intensity orchard in Abruzzo region (Italy). Regarding vegetative parameters the canopy growth and trunk area growth were registered. Regarding productive aspects the ripening process, the yield and the quality of the oil obtained were evaluated. The most productive varieties were 'Arbosana' and 'Arbequina', 'FS 17' and 'Don Carlo' had respectively lower production. 'Don Carlo' and 'FS 17' had bitterer and more spicy oils than 'Arbequina' and 'Arbosana' that gave equilibrated oils. 'FS 17' and 'Don Carlo' had the highest crown volume followed by 'Arbequina' and 'Arbosana' respectively. 'Arbosana' had the highest efficiency index (yield/m^3 of crown) followed by 'Arbequina', 'FS 17' and 'Don Carlo'. In 2009 'FS 17' showed a particular sensibility to olive fly which was probably due to the low hardness and high dimension of the fruits. Considering the data of these two years we concluded that 'Arbosana' and 'Arbequina' are probably suitable for this kind of training system in Central Italy. 'Don Carlo' and 'FS 17' had some problems related to yield (especially 'Don Carlo') and vigor that might influence negatively their economical results in high-intensity olive orchards.

S08.246

Microsatellite Markers to Fingerprinting of Extremadura (Spain) Olive Tree Varieties

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Modern societies are demanding quality control standards to ensure the origin and authenticity of the products they consume. Correct identification of varieties is crucial, since identification of olive cultivars is complicated by the large number of synonyms and homonyms, the intensive exchange of plant material, the presence of varietal clones, and problems of certification of varieties in garden center. Molecular marker techniques have been used to characterize olive cultivars and clones. Microsatellites are the most useful molecular marker used. A series of microsatellite markers already developed and its sequences have been published (Rallo *et al.*, 2000; Sefc *et al.*, 2000, Carriere *et al.*, 2002, Cipriani *et al.*, 2002). In previous work (Llerena *et al.*, 2008) a characterization of olive tree was carried out using agronomical parameters and their results show that there are several cultivars different between them. This study aims to test the efficiency of SSR markers to identify and to differentiate a set of 38 Extremadura olive varieties. The SSR dendrogram based on unweighted pair-group cluster analysis using Jaccard´s index reveals that the genetic diversity is very high between some cultivars of the same variety. A trend of clustering together of accessions originating from the same or adjacent locals was also observed. Because of the confusion surrounding the origin of most olive cultivars, their molecular identification and ascertainment of origin will be extremely useful for germplasm management and breeding. This research showed that SSR is a suitable and effective tool to characterize olive varieties of Spanish region of Extremadura.

S08.247

Characterization of Olive Trees of Extremadura by Cluster Analysis

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The olive (*Olea europaea* L.) is one of the oldest agricultural tree crops, and is cultivated for both oil and fruit. A characterization would help with the identification of olive tree cultivars to store plant material and gain knowledge of environmental adaptations. Molecular linkage maps based on DNA markers are widely recognized as essential tools for genetics research and breeding in many species, but often the lack of molecular markers makes their preparation a long and expensive process. The aim of the present work was to perform a cluster analysis using data obtained by two alternative methods – a genetic analysis and the morphological analysis of leaves and fruit – and to compare the degree of similarity between them. A cluster analysis seeks to identify homogeneous subgroups of cases in a population by minimizing within-group variation and maximizing between-group variation. The clustering of profiles was performed by a dendrogram following Ward's minimum variance algorithm. The same three parameters were analyzed in leaves, fruit, and